

On certain new or peculiar North American  
Hyphomycetes. II.

*Helicocephalum*, *Gonatorrhodiella*, *Desmidiospora* nov.  
genera and *Everhartia lignatilis* n. sp.

ROLAND THAXTER.

(WITH PLATES XIX AND XX.)

***Helicocephalum*** nov. gen.—Sterile hyphæ of small diameter, aseptate or rarely septate, creeping over the substratum and giving rise to highly differentiated, erect, simple, aseptate sporiferous hyphæ furnished with rhizoid like attachments at the base and spirally coiled at the apex: the spiral portion becoming septate and constricted at intervals, its segments separating at maturity in the form of large, dark colored, thick walled spores.

***Helicocephalum sarcophilum*** n. sp.—Plate XIX, figs. 1–5. Sterile hyphæ hyaline, creeping, branched,  $2\mu$  in diameter. Fertile hyphæ hyaline, 1 mm. or more in height,  $20\text{--}25\mu$  in diameter near the base and  $8\text{--}10\mu$  near the apex: tapering gradually upwards from a slightly swollen base: two or three times abruptly spirally coiled at the distal end, the spiral portion of large diameter and converted at maturity into a chain of seldom more than twenty-one spores, by the formation of successive septa. Spores brown, thick walled, with finely granular contents, asymmetrical, usually obliquely truncate, or not evenly rounded, at either end; at first hyaline then brown,  $55 \times 30\mu$  (maximum  $65 \times 35\mu$ ), separating and ultimately cohering in a viscous, rounded mass.

On carrion. Connecticut.

This remarkable form made its appearance on a laboratory culture in company with *Cæmanssiella spiralis* Eidam. It is not gregarious, appearing here and there on the substratum, and closely resembles a large *Mortierella* or *Syncephalis*; the spiral portion holding a drop of somewhat viscous fluid, which gives it the appearance of a large spherical head (fig. 1). The spores mature simultaneously, falling apart and cohering as shown in fig. 4. They are very thick walled and all attempts to germinate them in nutrient media proved fruitless.

The relations of this plant are quite uncertain, no fungus which appears even remotely connected with it being known to the writer. It is placed here among the Hyphomyceteæ

from lack of evidence which would refer it elsewhere. In its mode of growth it recalls *Mortierella* and similar forms; but its type of spore formation, as well as the character of its spores, is quite distinct from that which occurs in any of the genera of *Mucoraceæ*; among which, however, it is not impossible that it may eventually find a place.

***Gonatorrhodiella*** nov. gen. — Sterile hyphæ hyaline, creeping, septate and branched. Fertile hyphæ erect, sparingly septate, swelling into a spherical terminal sporiferous head, which after maturity may become once or twice proliferous, the proliferations also forming similar proliferating heads, the resulting hypha presenting ultimately the appearance of a successively inflated filament. Spores formed directly from short processes covering the fertile head, in chains of a definite number, by successive apical budding.

***Gonatorrhodiella parasitica*** n. sp. — Plate XIX, figs. 7–10.

Fertile hyphæ gregarious, simple or rarely dichotomously branched, sparingly septate, hyaline becoming pale fawn colored, seldom more than five times successively proliferous,  $8-12\mu$  in diameter, sometimes more than 1 mm. in height. Sporiferous head nearly spherical to oval, rarely producing more than a single proliferation,  $25-35\mu$  in diameter, maximum  $43 \times 36\mu$ . Spores in chains of three, hyaline, then fawn colored, oval to elliptical, caducous,  $8.5 \times 6-12 \times 7\mu$  the basal ones the largest.

On *Hypocrea* and *Hypomyces*. Connecticut.

This species has been met with in several localities about New Haven always growing directly upon, or running a short distance from certain species of *Hypocrea* and *Hypomyces* on which it appears to be parasitic. The genus is distinguished from *Gonatorrhodum* Corda, to which it bears a superficial resemblance, by the absence of the large, septate, subverticillate "ramuli" which give rise to the spores in the last named genus; as well as by its definite spore formation, the indefinite and often branched spore-chains of *Gonatorrhodum* being replaced by short simple chains composed of a small and invariable number of spores. Whether the successive apical formation of the spores in the present genus does not constitute another essential difference, cannot be determined from Corda's description; but from his figure as well as from analogy with other genera, like *Aspergillus*, *Verticillium*, etc. to which he compares it, a successive basal spore formation

may be inferred in *Gonatorrhodum* from the large basidia or "ramuli," as well as from the spore of the primary chain from which a secondary chain occasionally springs. The present genus is purely Mucedinous; while, as Saccardo remarks, *Gonatorrhodum* seems rather to belong among the Dematiæ.

**Desmidiospora** nov. gen.—Spores of two kinds, on the same mycelium of hyaline septate hyphæ: microconidia, small, hyaline, subfusiform, produced at the apex of subulate lateral basidia: macroconidia very large, terminal, brown, flat, multilocular, several times successively, more or less irregularly, dichotomously lobed.

**Desmidiospora myrmecophila** n. sp.—Plate XX, figs. 1–9.

Hyphæ much branched and septate covering the host in a white flocculent mass. Microconidia subfusiform, slightly asymmetrical  $12 \times 2-2.5 \mu$ , produced sideways at the apex of subulate basally inflated basidia. Macroconidia terminal, short stalked, three to five or even six times successively dichotomously lobed, irregularly multilocular, very thick walled, reddish brown or fawn colored,  $80 \times 68 \mu$ , maximum  $100 \times 90 \mu$ .  $12-14 \mu$  in thickness.

On a large ant. Connecticut.

This remarkable plant has been met with only once growing luxuriantly on a large black ant which was found fastened to the under side of a rotting log. The hyphæ emerged especially from between the abdominal segments, enveloping the insect more or less completely and extending a short distance over the substratum. It is not impossible that this may be an imperfect form of some *Cordyceps*, perhaps *C. unilateralis* Tul., which is the only species of the genus that the writer has observed on ants in this vicinity. No analogous form, bearing the same relation to *Cordyceps* that *Mycogone* or *Sepe-donium*, for instance, are supposed to bear to other Hypocreaceous genera, has been observed, as far as known to the writer. The microconidia in the present instance are, however, certainly very similar in appearance and mode of formation to conidia known to be associated with certain species of *Cordyceps*: yet the connection cannot be assumed and the use of a new generic name seems unavoidable. It is not unlikely, moreover, that the fungus under consideration may be mycophilous and like certain species of *Gymnoascus*, *Thielavia*, *Melanospora*, etc., which so often interfere with artificial cultures, be parasitic on an immature *Isaria* or *Cordyceps* previously developed within the insect.

**Everhartia lignatilis** n. sp.—Plate XX, figs. 10–12.

Scattered, superficial, stipitate or substipitate, yellowish becoming blackish towards the base, subcylindrical or expanding upwards,  $250-400 \times 100-150\mu$ . Spores hyaline, terminal, 3-septate, cylindrical or slightly flattened,  $4\mu$  in diameter, the rounded base and snout-like apex approaching one another in a single convolution  $12-13 \times 8-9\mu$ : extruded in a yellow viscous rounded mass. Sporiferous hyphæ septate, subdichotomously branched, mingled with longer usually simple sterile hyphæ.

On wet logs. Connecticut.

This species occurs not uncommonly about New Haven on very rotten wet logs. It differs from *E. hymenuloides* Sacc. & Ell. in being stipitate as well as in its very distinct and smaller spores. The latter are produced in enormous quantities adhering to the apex in a yellowish viscous drop. The spores germinate readily in water, producing single hyphæ from the convexity of each segment.

EVERHARTIA HYMENULOIDES Sacc. & Ellis.—Plate XX, figs. 13–14.—Figures of the spores of this species are given for comparison drawn from material distributed in Ellis N. A. F. No. 969 on dead leaves of *Sorghum nutans*. In this species the sporodochia are sessile and ill defined, the spores being produced terminally on short simple hyphæ (fig. 14). The spores are formed in a helix of several convolutions,  $16 \times 20\mu$ , and are about  $3.5-4\mu$  in diameter, extruded in a viscous mass and surrounded by a coarsely granular greenish mucus.

EXPLANATION OF PLATES.

Plate XIX.—*Helicocephalum sarcophilum*, n. sp.—Fig. 1. Nearly mature plant showing general habit, with rhizoidal attachment at base and drop of viscous fluid held by the spiral.  $\times 136$ . Fig. 2. Spiral portion enlarged,  $\times 232$ . Fig. 3. Young spiral before division has commenced,  $\times 200$ . Fig. 4. Spiral after maturity, the spores separated and cohering in a viscous mass,  $\times 232$ . Fig. 5. Two mature spores,  $\times 696$ . Fig. 6. A spore in optical section,  $\times 696$ .

Plate XIX.—*Gonatorrhodiella parasitica*, n. sp. Fig. 7. Fertile hyphæ, showing single and double proliferation, the left hand head mature, the right beginning the fifth proliferation,  $\times 232$ . Fig. 8. Portions of two fertile hyphæ, one simple and showing mature spore chains *in situ*, the other furcate and immature,  $\times 348$ . Fig. 9. Mature spore chain,  $\times 696$ . Fig. 10. Spore chain showing budding of apical spore,  $\times 696$ .

Plate XX.—*Desmidiospora myrmecophila*, n. sp.—Fig. 1. Portion of hyphæ showing microconidia on subulate basidia,  $\times 348$ . Figs. 2–6. Showing successive stages in the development of the macroconidia,  $\times 348$ . Fig. 7. Macroconidium in which the transverse walls are partly formed,  $\times 348$ . Fig. 8. Two mature macroconidia,  $\times 348$ . Fig. 10. Macroconidium viewed horizontally,  $\times 348$ .

Plate XX.—*Everhartia lignatilis*, n. sp. Fig. 10. General habit showing rounded mass of extruded spores,  $\times 68$ . Fig. 11. Sterile and fertile hyphae of sporodochium, showing stages in formation of helicospores,  $\times 464$ . Fig. 12. Mature spores,  $\times 696$ .

Plate XX.—*Everhartia hymenuloides* Sacc. & Ell. Fig. 13. Mature spores,  $\times 696$ . Fig. 14. Spore *in situ*, showing terminal formation,  $\times 696$ .

## Notes on North American Mosses. II.

CHARLES REID BARNES.

DICRANUM PALUSTRE LaPyl.—This species has not been noted as particularly variable as is the case with its congener, *D. scoparium* Hedw. The examination of a large series of specimens, collected in various parts of the northwestern United States by Dr. Julius Röhl in 1888, has shown me that it is almost as polymorphous as *D. scoparium*, and that it intergrades so closely with that species that it is quite impossible to limit it except in a wholly arbitrary way. The var. *paludosum* of *D. scoparium* imitates somewhat the typical *D. palustre* in the rugulose and shorter pointed leaves. But this is a character by no means constant in the latter species. Indeed it is oftener absent than present. There is also no reliable distinction to be drawn from the section of the costa. We have therefore simply to say that those forms with slender pointed often falcate leaves, having the cells somewhat elongated in the upper part, shall be grouped with *D. scoparium*. I have not thought it worth while to characterize separately any of those forms of *D. palustre* (among which the Californian variety *Brewerianum* of Lesquereux may well be placed) which connect with the palustral modifications of *D. scoparium*. If one should begin, the list might rival that of some of the *Sphagna*! On the other hand *D. palustre* shows numerous variations toward forms with broad leaves, entire or coarsely serrated and usually not wrinkled. Three of these I have separated as well-marked varieties,<sup>1</sup> which fall more or less closely into company with the European vars. *juniperifolium* and *polycladon* of the Bry. Eu. Had the intermediate forms been lacking from the collection I should have unhesitatingly established these, or at least the var. *Roellii*, as species.

Having already examined a considerable number of the species of *Dicranum* in determining the Weisiaceæ of Röhl's

<sup>1</sup> Botanisches Centralblatt xliv. 386 (1890).